# (Alg 1) Unit 1: Solving Linear Equations

Content Area: **Math**
Course(s): **Math**
Time Period: **September**
Length: **3 weeks**
Status: **Published**

## Unit Overview

In this unit, students will learn about the following topics:

- Using order of operations to simplify numerical expressions

- evaluate algebraic expressions for one or more variables

- Solving equations in one variable (one-step, two-step, multi-step)

- Solving equations with special solutions (no solution or infinitely many solutions)

- Solving absolute value equations

- Rewriting equations & formulas

## Enduring Understandings

SWBAT:

- Solve one-step equations

- Solve two-step equations

- Solve multi-step equations with variables on one side of the equation

- Solve multi-step equations with variables on both sides of the equation

- Solve equations with special solutions (no solution or infinitely many solutions)

- Determine if a value is a solution to an equation in one variable

- Solve an equation involving one or more absolute value expressions

- Rewrite equations and formulas to solve for one variable in terms of others

- Solve real-world problems that can be modeled by equations

- Translate a verbal sentence to an equation and subsequently solve that equation

## Essential Questions

How can we:

- solve multi-step linear equations and use them to solve real-world problems?
- apply the addition or subtraction property of equality to generate equivalent equations?
- apply the multiplication or division property of equality to generate equivalent equations?
- use reciprocals to isolate a variable?
- check a solution to the equation?
- use unit analysis to model real-life problems?
- solve linear equations with a variable on one or both sides of the equation?
- identify equations with no solution or infinitely many solutions?
- solve absolute value equations involving one or two absolute value expressions?
- determine when absolute value equations have special solutions?
- identify equations with extraneous solutions?
- rewrite & use literal equations and common formulas?

## Instructional Strategies & Learning Activities

- Guided Practice
- Daily Do Now
- Extra Practice & Puzzle Time (Resources)
- Scavenger Hunts
- Coloring Activities
- Task Cards (Around the World)
- Maze Activities
- Quizizz Online Assignments
- Kahoot! Online Games
- GimKit Online Games

## Integration of 21st Century Themes and Skills

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| CRP.K-12.CRP1.1 | Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good. |
| CRP.K-12.CRP2.1 | Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation. |

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| PFL.9.1.8.A.7 | Explain the purpose of the payroll deduction process, taxable income, and employee benefits. |
| PFL.9.1.8.G.1 | Explain why it is important to develop plans for protecting current and future personal assets against loss. |
| WRK.K-12.P.5 | Utilize critical thinking to make sense of problems and persevere in solving them. |
| WRK.K-12.P.8 | Use technology to enhance productivity increase collaboration and communicate effectively. |
| WRK.K-12.P.9 | Work productively in teams while using cultural/global competence. |
| TECH.9.4.8.CT.2 | Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1). |
| TECH.9.4.8.CT.3 | Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome. |
| TECH.9.4.8.TL.3 | Select appropriate tools to organize and present information digitally. |

## Technology & Design Integration

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| CS.6-8.8.1.8.AP.2 | Create clearly named variables that represent different data types and perform operations on their values. |
| CS.6-8.8.1.8.AP.4 | Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs. |
| CS.6-8.8.1.8.AP.6 | Refine a solution that meets users' needs by incorporating feedback from team members and users. |
| CS.6-8.8.1.8.AP.8 | Systematically test and refine programs using a range of test cases and users. |
| TECH.8.1.8.A.1 | Demonstrate knowledge of a real world problem using digital tools. |
| TECH.8.1.8.A.CS1 | Understand and use technology systems. |
| TECH.8.1.8.B.CS1 | Apply existing knowledge to generate new ideas, products, or processes. |
| TECH.8.1.8.E.CS1 | Plan strategies to guide inquiry. |
| TECH.8.1.8.F | Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. |
| TECH.8.1.8.F.CS1 | Identify and define authentic problems and significant questions for investigation. |
| TECH.8.2.8.D.CS1 | Apply the design process. |

## Interdisciplinary Connections

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| ELA.L.KL.8.2.A | Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases. |
| ELA.L.KL.8.2.B | Gather vocabulary knowledge when selecting a word or phrase important to comprehension or expression. |
| ELA.L.VL.8.3.A | Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. |
| ELA.L.VL.8.3.B | Analyze the impact of specific word choices on meaning and tone. |
| ELA.L.VL.8.3.C | Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., precede, recede, secede). |

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| ELA.L.VL.8.3.D | Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech. |
| SCI.MS.ETS1.B | Developing Possible Solutions |
| SCI.MS.ETS1.C | Optimizing the Design Solution |

## Differentiation

**Definitions of Differentiation Components:**

- Content – the specific information that is to be taught in the lesson/unit/course of instruction.
- Process – how the student will acquire the content information.
- Product – how the student will demonstrate understanding of the content.
- Learning Environment – the environment where learning is taking place including physical location and/or student grouping

**Differentiation occurring in this unit:**

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.
- High-achieving students can complete sudoku puzzles and logic puzzles as extension activities.
- Limit number/difficulty of problems for low-achieving students to demonstrate mastery.
- Narrow down problem choice to core concepts for low-achieving students.
- Leveled group-based activities, determined by formative assessment.

## Modifications & Accommodations

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.
- High-achieving students can complete sudoku puzzles and logic puzzles as extension activities.
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- Narrow down problem choice to core concepts for low-achieving students.
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## Benchmark Assessments

**Schoolwide Benchmark assessments:**

- Linkit Benchmarks (Form A in September, Form B in January, Form C in June): Linked to NJSLA standards

**Additional Benchmarks used in this unit:**

- IXL Diagnostic + continued practice during IXL periods

## Formative Assessments

**Formative Assessments used in this unit:**

- Kahoot! Games

- Quizizz Games

- Homework

- Q & A

- Scavenger Hunts

- Coloring Activities

- Task Cards

- Partner Activities

## Summative Assessments

**Summative assessments for this unit:**

- Chapter Test
- Quizzes

## Instructional Materials

1. Big Ideas Math: Math & You 6th Grade Textbook
2. Quizizz
3. Kahoot!
4. Scavenger Hunts
5. Task Cards
6. Coloring Activities
7. GimKit

## Standards

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| MATH.9-12.N.Q.A.1 | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. |
| MATH.9-12.A.CED.A.1 | Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. |
| MATH.9-12.A.CED.A.4 | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. |
| MATH.9-12.A.REI.A.1 | Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. |
| MATH.9-12.A.REI.B.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. |